

ADDITIONAL NOTES ON THE ERIOCAULACEAE. XLIV

Harold N. Moldenke

PAEPALANTHUS ASPER Alv. Silv.

Additional bibliography: Wangerin in Just, Bot. Jahresber. 57 (1): 475. 1937; Moldenke, Phytologia 25: 150. 1973.

PAEPALANTHUS ATER Alv. Silv.

Additional bibliography: Wangerin in Just, Bot. Jahresber. 57 (1): 475. 1937; Moldenke, Phytologia 25: 150. 1973.

PAEPALANTHUS ATROVAGINATUS Ruhl.

Additional bibliography: Wangerin in Just, Bot. Jahresber. 57 (1): 476. 1937; Moldenke, Phytologia 25: 150. 1973.

PAEPALANTHUS AUREUS Alv. Silv.

Additional bibliography: Wangerin in Just, Bot. Jahresber. 57 (1): 475. 1937; Moldenke, Phytologia 25: 150. 1973.

PAEPALANTHUS BABYLONIENSIS Alv. Silv.

Additional bibliography: Wangerin in Just, Bot. Jahresber. 57 (1): 475. 1937; Moldenke, Phytologia 25: 150—151. 1973.

PAEPALANTHUS BARAUNENSIS Alv. Silv.

Additional bibliography: Wangerin in Just, Bot. Jahresber. 57 (1): 475. 1937; Moldenke, Phytologia 25: 151. 1973.

PAEPALANTHUS BARBIGER Alv. Silv.

Additional bibliography: Wangerin in Just, Bot. Jahresber. 57 (1): 475. 1937; Moldenke, Phytologia 25: 151. 1973.

PAEPALANTHUS BARREIRENSIS Alv. Silv.

Additional bibliography: Wangerin in Just, Bot. Jahresber. 57 (1): 475. 1937; Moldenke, Phytologia 25: 152. 1973.

PAEPALANTHUS BATATALENSIS Alv. Silv.

Additional bibliography: Wangerin in Just, Bot. Jahresber. 57 (1): 475. 1937; Moldenke, Phytologia 25: 152. 1973.

PAEPALANTHUS BENEDICTI Alv. Silv.

Additional bibliography: Wangerin in Just, Bot. Jahresber. 57 (1): 475. 1937; Moldenke, Phytologia 25: 152. 1973.

PAEPALANTHUS BIFIDUS (Schrad.) Kunth

Additional bibliography: Uittien & Heyn in Pulle, Fl. Surin. 1 [Meded. Konink. Ver. Inst. 30, Afd. Handelmsmus. 11]: 216—217. 1938; Teunissen & Wildschut, Verh. Konink. Nederl. Akad. Wet. Natuurk. 59 (2): 23. 1970; Teunissen & Wildschut, Meded. Bot. Mus. Utr. 341: 23. 1971; Moldenke, Phytologia 25: 152—153, 160, & 240.

1973.

Miss Mexia describes this plant as an herb with brownish-white flowers, "common locally in sandy soil among rocks on slope".

Uittien & Heyn (1938) cite for this species the following specimens from Surinam: B.W. 1126a, Collector undetermined 179 & s.n., Essed s.n., Focke 124, 480, & 1382, Kegel 1475, Lanjouw 162, Rolander s.n., Splitgerber 1129, Versteeg 29, and Wullschnägel 1645, flowering in March, April, and July to September. They record the vernacular names "woka" and "waroe koemakoebia".

Additional citations: BRAZIL: Minas Gerais: Mexia 5816 (Ba).

PAEPALANTHUS BIFRONS Alv. Silv.

Additional bibliography: Wangerin in Just, Bot. Jahresber. 57 (1): 475. 1937; Moldenke, Phytologia 25: 153. 1973.

PAEPALANTHUS BOMBACINUS Alv. Silv.

Additional bibliography: Wangerin in Just, Bot. Jahresber. 57 (1): 475. 1937; Moldenke, Phytologia 25: 153. 1973.

PAEPALANTHUS BRACHYPSUS (Bong.) Kunth

Additional & emended bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 3, 189-191, & 289, fig. 25. 1903; Moldenke, Phytologia 25: 154. 1973.

Silva describes this plant as an herb, 20 cm. tall, growing in large colonies on campos near sandstone outcrops. Rizzini found it in fruit in July.

Additional citations: BRAZIL: Minas Gerais: Rizzini 2 (Ld); J. B. Silva 360 [Herb. Set. Lag. 697] (Ba).

PAEPALANTHUS BREVICAULIS Alv. Silv.

Additional bibliography: Wangerin in Just, Bot. Jahresber. 57 (1): 475. 1937; Moldenke, Phytologia 25: 155-156. 1973.

PAEPALANTHUS BROMELIOIDES Alv. Silv.

Additional bibliography: Wangerin in Just, Bot. Jahresber. 57 (1): 475. 1937; Araujo, Rev. Bras. Biol. 31: 507-511, fig. 9 & 10. 1971; Anon., Biol. Abstr. 54 (10): B.A.S.I.C. S.191. 1972; A. K. W., Biol. Abstr. 54: 5378. 1972; Moldenke, Phytologia 25: 157-158. 1973.

Additional illustrations: Araujo, Rev. Bras. Biol. 31: 510, fig. 9 & 10. 1972.

Araujo (1971) has described a new species of termite, Nasutitermes rizzinii, in association with P. bromelioides in the Serra do Cipó, Minas Gerais, Brazil, where he says that this plant is "commonly met with at altitudes of 1,300 m." He also says that "This plant is apparently a choice feeding place for Nasutitermes rizzinii.....However neither young plants, up to 10-15 cm. high, with reduced stems and mantles nor old plants with very thick, decomposing mantle harbour the termites. On the other hand, practically every adult, normal plant was found to contain groups of these insects. Paepalanthus bromelioides, which looks very much

like certain bromeliads, is one of the largest known Eriocaulaceae. It attains commonly both a height and a diameter of ca. 50 cm., with ribbon-shaped, flattened floral stalks. At their insertion point, its hard leaves are provided with a dense ring of long hairs. Following the shedding of the blades the remaining sheaths surround the stem forming a brownish mantle. The stem is a rather hard tubercle, about 2-5 cm. long in the adult plant, enveloped by a thin rind; its core is bright yellow and rich in water, and from its bottom numerous fasciculated roots spread out. The plants are generally embedded up to the foliar rosette in a peculiar sand block...., as if in a plant-pot filled to the brim. In some areas, however, the plants are free of the sand and remain at soil level. These blocks of sand piled around and adherent to the plants are erected by the termites which are found in short, narrow, somewhat branched tunnels. In spite of no termites having been found outside the sand pile, it was seen that these tunnels originate in the soil and lead into the dead zone of the stem, not reaching the live core. Nasutitermes rizzinii workers and soldiers were found only inside the dead rotting lower portion of the mantle and in the upper part of the stem of Paepalanthus bromelioides. The presence of the termites is revealed by holes and irregular depressions on the external surface of mantle and stem. The total area occupied by the termites is small as are also the termite groups. The plant affords these termites shelter and food, apparently suffering no inconvenience from their presence. An analysis of the 'termitarium' sand disclosed a slightly higher percentage of carbon and nitrogen than is found in the lighter coloured surrounding soil. This condition possibly derives from the rotting of the mantle."

The Irwin, Maxwell, & Wasshausen 1961, cited as P. bromelioides by me in a previous installment of these notes, proves to be P. pauciflorus Körn. instead, while Maguire, Maguire, & Murça Pires 14680 and Mello Barreto 2478 are P. vellozzioides Körn.

PAEPALANTHUS BULBOSUS Alv. Silv.

Additional bibliography: Wangerin in Just, Bot. Jahresber. 57 (1): 475. 1937; Moldenke, Phytologia 25: 161. 1973.

PAEPALANTHUS CABRALENSIS Alv. Silv.

Additional bibliography: Wangerin in Just, Bot. Jahresber. 57 (1): 475. 1937; Moldenke, Phytologia 25: 162. 1973.

PAEPALANTHUS CACHAMBUENSIS Alv. Silv.

Additional bibliography: Wangerin in Just, Bot. Jahresber. 57 (1): 475. 1937; Moldenke, Phytologia 25: 162. 1973.

PAEPALANTHUS CAESPITITIUS Mart.

Additional & emended bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 124, 132, [283], 284, 286, & 289. 1903; Moldenke, Phytologia 25: 163. 1973.

PAEPALANTHUS CALDENSI Malme

Additional bibliography: Wangerin in Just, Bot. Jahresber. 57 (1): 477. 1937; Moldenke, Phytologia 25: 164-166 & 241. 1973.

The Baileys found this plant in flower and fruit in February. Other collectors have found it in fruit in October and December, growing in sloughs, wet meadows, and swampy places. The flowers are said to have been "white" on Mello Filho 683. Material has been misidentified and distributed in some herbaria as Eriocaulon sp.

Additional citations: BRAZIL: Paraná: Dusén 15620 (G); Hatschbach 27143 (N); F. C. Hoehne s.n. [20-10-28] (Sp-23111), s.n. [1-11-28] (Sp-23237); Pabst 10114 (Ja-77108); E. Pereira 5182 (Ja-105726); Princeza Imperial s.n. [Herb. Saldanha 8808] (Ja-47850); Stawiarski s.n. [XII/950-I/952] (Ja-126555). Rio Grande do Sul: Bornmüller 758 (W). Santa Catarina: B. Lutz s.n. [30/XII/1949] (Ja-126559); Mello Filho 683 (Ja-49608); E. Pereira 6357 [Pabst 6184] (Ja-115509); Smith, Klein, & Hatschbach 15695 (Ld). São Paulo: Bailey & Bailey 848 (Ba).

PAEPALANTHUS CALLOCEPHALUS Alv. Silv.

Additional bibliography: Wangerin in Just, Bot. Jahresber. 57 (1): 475. 1937; Moldenke, Phytologia 25: 166. 1973.

PAEPALANTHUS CALLOCEPHALUS var. CILIATUS Alv. Silv.

Additional bibliography: Moldenke, Phytologia 25: 166. 1973. Silveira (1928) describes this variety as "Folia toto margine brevi ciliata, 6--10 cm. longa, 3--4 mm. lata."

PAEPALANTHUS CALLOCEPHALUS var. GLABER Alv. Silv., Fl. Mont. 1: 31 [as "glabra"]. 1928.

Synonymy: Paepalanthus callocephalus var. glabra Alv. Silv., Fl. Mont. 1: 31. 1928.

Bibliography: Alv. Silv., Fl. Mont. 1: 31 & 403. 1928; Moldenke, Known Geogr. Distrib. Erioc. 10 & 46. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 82 & 208. 1949; Moldenke, Résumé 96, 323, & 486. 1959; Moldenke, Fifth Summ. 1: 159 (1971) and 2: 579 & 948. 1971.

This variety is based on A. Silveira 768, collected in sandy fields between Serro and Diamantina, in the Serra Geral, Minas Gerais, Brazil, in June of 1925 and is deposited in the Silveira herbarium. On page 403 of his work (1928) Silveira gives the date of collection as "1926" -- whether this is an error or is intended as a correction of the date given in the original description is unclear. He describes the taxon as "Folia ab inicio toto glabra, angusta, 2 mm. lata. Vaginae pilis brevibus erectisque pubescentes."

PAEPALANTHUS CALLOCEPHALUS var. VILLOSUS Alv. Silv., Fl. Mont. 1: 31 [as "villosa"]. 1928.

Synonymy: Paepalanthus callocephalus var. villosa Alv. Silv.,

Fl. Mont. 1: 31 & 403, pl. 13. 1928. Paepalanthus callocephalus villosus Alv. Silv. ex Worsdell, Ind. Lond. Suppl. 2: 183. 1941.

Bibliography: Alv. Silv., Fl. Mont. 1: 31 & 403, pl. 13. 1928; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 10 & 46. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 82 & 208. 1949; Moldenke, Résumé 96, 323, & 486. 1959; Moldenke, Fifth Summ. 1: 159 (1971) and 2: 579 & 948. 1971; Moldenke, Phytologia 25: 166. 1973.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 13. 1928.

This variety is based on A. Silveira 767, collected in sandy fields between Serro and Diamantina, in the Serra Geral, Minas Gerais, Brazil, in June, 1925, and is deposited in the Silveira herbarium. As in the case of the preceding variety, Silveira, on page 403 of his monumental work (1928), gives 1926 as the date of collection of the type number. Again, it is not clear if this is an error, correction of a previous error, or a second collection under the same herbarium number. He describes the taxon as "Folia praecipue apicem versus utrinque brevi pilosa. Vaginae pilis longiusculis perturbatisque dense pubescentes, demum glabrescentes. Pedunculi circiter 20 cm. longi."

PAEPALANTHUS CALLOPHYLLUS Alv. Silv., Fl. Mont. 1: 217—218, pl. 144. 1928.

Bibliography: Alv. Silv., Fl. Mont. 1: 217—218, pl. 144. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 475. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 10 & 46. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 82 & 208. 1949; Moldenke, Résumé 96 & 486. 1959; Moldenke, Fifth Summ. 1: 159 (1971) and 2: 948. 1971.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 144. 1928.

The type of this species was collected by Álvaro Adolpho da Silveira (no. 504) in dry sandy fields near Mt. Itambé, Minas Gerais, Brazil, in April, 1908, and is deposited in the Silveira herbarium. Silveira (1928) says of this plant "A speciebus affinibus valde distincta pedunculis numerosissimis, capitulis minusculis et ipso habitu. Nomen e vocibus graecis, callos, bellus, et phyllus, folium, compositum, propter bellam foliorum formam et elegantem eorum dispositionem in ramis."

PAEPALANTHUS CALVOIDES Ruhl. in Engl., Pflanzenreich 13 (4-30): 146—147. 1903.

Synonymy: Paepalanthus calvooides Ruhl. in Engl., Pflanzenreich 13 (4-30): 127 & 289. 1903.

Bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 127, 146—147, & 289. 1903; Prain, Ind. Kew. Suppl. 3: 126. 1908; Moldenke, Known Geogr. Distrib. Erioc. 10 & 46. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 82 & 208. 1949; Moldenke, Résumé 96 & 486. 1959; Moldenke, Résumé Suppl. 1: 20 (1959) and 14: 2. 1966; Moldenke, Fifth Summ. 1: 159 (1971) and 2: 579 & 948. 1971.

This species is based on Glaziou 5455, collected in sandy campos on the summit of Itatiaia, Rio de Janeiro, Brazil, flowering in June, and deposited in the herbarium of the Botanisches Museum in Berlin where it was photographed by Macbride as his type photograph number 10578. Ruhland (1903) cites only the type collection and comments "Species P. calvo Koern. proxima. Sed nostra species foliis juventute ciliatis, brevioribus et angustioribus a P. calvo distincta est. In capitulis examinatis flores ♂ longe plurimi erant."

Citations: BRAZIL: Guanabara: A. Castellanos 25616 [Herb. Cent. Pesq. Florest. 4319] (Z). Rio de Janeiro: Glaziou 5455 [Macbride photos 10578] (B--type, N--photo of type, N--photo of type, W--photo of type, Z--isotype).

PAEPALANTHUS CALVUS Körn. in Mart., Fl. Bras. 3 (1): 391--392.
1863.

Synonymy: Dupatyia calva (Körn.) Kuntze, Rev. Gen. Pl. 2: 745. 1891. Dupatyia calva Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902.

Bibliography: Körn. in Mart., Fl. Bras. 3 (1): 391--392 & 507. 1863; Kuntze, Rev. Gen. Pl. 2: 745. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 2: 401. 1894; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 127, 147--149, [283], & 289. 1903; Alv. Silv., Fl. Mont. 1: 33 & 403. 1928; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1941; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 2: 401. 1946; Moldenke, Known Geogr. Distrib. Erioc. 10, 29, & 46. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 82 & 208. 1949; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Moldenke, Résumé 96, 279, & 486. 1959; Rennó, Levant. Herb. Inst. Agron. 69. 1960; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 2: 401. 1960; Moldenke, Phytologia 18: 254. 1969; Moldenke, Fifth Summ. 1: 159 & 478 (1971) and 2: 948. 1971.

Ruhland cites for this species only Langsdorff s.n. and Warming 539, both from Minas Gerais, Brazil, the latter photographed by Macbride in the herbarium at Copenhagen as his type photograph number 22280 although it is not the type collection. Actually, the species is based on the Langsdorff collection, since Körnicke's original (1863) citation is "Crescit in prov. Minarum, in alt. 7000 ped.: Langsdorff". Ruhland comments that "Diagnosis Koernickeana secundum specimina Warmingiana, jam a cl. Koernicke ad speciem citatam ducta, a me correcta". Silveira (1928) cites A. Silveira 409 from the Serra da Piedade, Minas Gerais, collected in 1903. The species has been found growing at altitudes of 1800 to over 2000 meters, flowering in January and February. It is said to be not uncommon from the middle altitudes to the summit of the Serra da Piedade. Irwin and his associates describe it as a rosette herb, with light-gray inflorescences to 40 cm. tall, growing on wet middle and upper mountain slopes in iron-rich soil. The Mexia 5833, distributed as P. calvus, is actually the type collec-

tion of Paepalanthus mediae Moldenke.

Citations: BRAZIL: Minas Gerais: Irwin, Harley, & Onishi 28748 (Z); Mendes Magalhães 515 [Herb. Jard. Bot. Belo Horiz. 34351] (N); Warming 539 [Macbride photos 22280] (B, N--photo, W--photo), s.n. [Brasilien] (B).

PAEPALANTHUS CAMPTOPHYLLUS Ruhl. in Engl., Pflanzenreich 13 (4-30): 174-175, fig. 2 A & B. 1903.

Bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 7, 173-175, & 289, fig. 2 A & B. 1903; Prain, Ind. Kew. Suppl. 3: 126. 1908; Alv. Silv., Fl. Mont. 1: 403. 1928; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 40 & 43, fig. 16 A & B. 1930; Moldenke, Known Geogr. Distrib. Erioc. 10 & 46. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 82 & 208. 1949; Moldenke, Résumé 96 & 486. 1959; Tomlinson in C. R. Metcalfe, Anat. Monocot. 3: 190. 1969; Moldenke, Fifth Summ. 1: 159 (1971) and 2: 948. 1971.

Illustrations: Ruhl. in Engl., Pflanzenreich 13 (4-30): 7, fig. 2 A & B. 1903; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 43, fig. 16 A & B. 1930.

This species is based on Glaziou 15520, collected at Caraça, Morro da Carapuça, Minas Gerais, Brazil, flowering in June, and deposited in the herbarium of the Botanisches Museum in Berlin where it was photographed by Macbride as his type photograph number 10579. Ruhland (1903) cites only this original collection and comments "Species a P. intermedio Koern. statim habitu (foliis longioribus etc.) et perigonis floris ♀ dignoscitur, a P. Bongardii iisdem notis et a P. Gardneriano Walp. pedunculis longioribus et vaginis persistenter pubescentibus differt". Silveira (1928) cites A. Silveira 425 from the type locality, collected in 1906. The plant has been found in anthesis in April and June. At least some of the printed labels accompanying Glaziou 15520 are inscribed "Rio de Janeiro", apparently in error.

Citations: BRAZIL: Minas Gerais: Glaziou 15520 [Macbride photos 10579] (B--type, Br--isotype, N--isotype, N--photo of type, N--photo of type, W--photo of type). Rio de Janeiro: L. B. Smith 6591 (W--2120189).

PAEPALANTHUS CAMPTOPHYLLUS var. GRACILIS Ruhl. in Engl., Pflanzenreich 13 (4-30): 175. 1903.

Bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 175 & 289. 1903; Alv. Silv., Fl. Mont. 1: 403. 1928; Moldenke, Known Geogr. Distrib. Erioc. 10 & 46. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 82 & 208. 1949; Moldenke, Résumé 96 & 486. 1959; Moldenke, Fifth Summ. 1: 159 (1971) and 2: 948. 1971.

The type of this variety was collected by Carl August Wilhelm Schwacke (no. 9440) in rocky ground on the Serra de Capanema, Minas Gerais, Brazil, in September of 1893, and is deposited in the herbarium of the Botanisches Museum in Berlin. Ruhland (1903) cites only the original collection which he says "Differt a forma typica habitu omnino graciliore, foliis brevioribus, angustiori-

bus, pedunculis paullo densius pilosis, nec non perigonis laetius coloratis bracteisque involucrantibus angustioribus". Silveira (1928) cites A. Silveira 246, also from the Serra do Capanama, collected in 1907.

Citations: BRAZIL: Minas Gerais: Schwacke 9440 (B--type, Z--isotype).

PAEPALANTHUS CANASTRENSIS Alv. Silv., Fl. Mont. 1: 228--229, pl. 151. 1928.

Bibliography: Alv. Silv., Fl. Mont. 1: 228--229 & 403, pl. 151. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 475--476. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 10 & 46. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 82 & 208. 1949; Moldenke, Résumé 96 & 486. 1959; Moldenke, Fifth Summ. 1: 159 (1971) and 2: 948. 1971.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 151. 1928.

The type of this species was collected by Álvaro Adolfo da Silveira (no. 745) in wet sandy fields in the Serra da Canastra, Minas Gerais, Brazil, in April, 1925, and is deposited in the Silveira herbarium. Silveira (1928) says "Species a precedente [P. gustavii Alv. Silv.] ramulis peduncularum pubescentibus et pedunculis folia valde superantibus praecipue differt. Fortasse varietas illius species?" To me the species seems to be extremely closely related to P. bromelioides Alv. Silv.

PAEPALANTHUS CANDIDUS Alv. Silv., Fl. Serr. Min. 38, pl. 12. 1908.

Bibliography: Alv. Silv., Fl. Serr. Min. 38, pl. 13. 1908; Alv. Silv., Fl. Mont. 1: 35--37 & 403, pl. 17. 1928; Stapf, Ind. Lond. 4: 518. 1930; A. W. Hill, Ind. Kew. Suppl. 8: 169. 1933; Wangerin in Just, Bot. Jahresber. 57 (1): 476. 1937; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 10 & 46. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 82 & 208. 1949; Moldenke, Résumé 96 & 486. 1959; Moldenke, Fifth Summ. 1: 159 (1971) and 2: 949. 1971.

Illustrations: Alv. Silv., Fl. Serr. Min. pl. 13. 1908; Alv. Silv., Fl. Mont. 1: pl. 17. 1928.

This species is based on A. Silveira 358, collected in sandy fields near Lapinha and near Capão Redondo, in the Serra do Cipó, Minas Gerais, Brazil, in April of 1905, both deposited (apparently under the same number) in the Silveira herbarium. Silveira (1928) comments that "Species ab densissimam et albissimam capitulum villositatem valde distincta". The Mello Barreto 4740, distributed as P. candidus, is actually P. elongatus var. ciliatus Körn.

Citations: BRAZIL: Minas Gerais: A. Silveira 359 (B--isotype, Z--isotype).

PAEPALANTHUS CANESCENS (Bong.) Körn. in Mart., Fl. Bras. 3 (1): 381--382. 1863.

Synonymy: Eriocaulon canescens Bong., Mém. Acad. Imp. Sci. St.

Pétersb., sér. 6, 1: 623. 1831. Paepalanthus canescens Körn. in Mart., Fl. Bras. 3 (1): 278. 1863. Paepalanthus canescens var. ♂ Körn. in Mart., Fl. Bras. 3 (1): 382. 1863. Paepalanthus canescens var. ♀ Körn. in Mart., Fl. Bras. 3 (1): 382. 1863. Dupatya canescens (Bong.) Kuntze, Rev. Gen. Pl. 2: 745. 1891. Dupatya canescens Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902.

Bibliography: Bong., Mém. Acad. Imp. Sci. St. Pétersb., sér. 6, 1: 623, [pl. 50]. 1831; Bong., Ess. Monog. Erioc. 23. 1831; Steud., Nom. Bot., ed. 2, 2, 1: 585. 1840; Kunth, Enum. Pl. 3: 573 & 612. 1841; D. Dietr., Syn. Pl. 5: 266. 1852; Steud., Syn. Pl. Glum. 2: [Cyp.] 275 & 333. 1855; Körn. in Mart., Fl. Bras. 3 (1): 278, 381—383, & 507. 1863; Kuntze, Rev. Gen. Pl. 2: 745. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 877 (1893) and 2: 401. 1894; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 135, 179, [283], 285, & 289. 1903; Alv. Silv., Fl. Mont. 1: 403. 1928; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 51. 1930; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1941; Moldenke, Known Geogr. Distrib. Erioc. 11, 29, 33, & 46. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 877 (1946) and 2: 401. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 82 & 208. 1949; Moldenke, Résumé 96, 279, 286, 323, & 486. 1959; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Moldenke, Résumé Suppl. 1: 20. 1959; Rennó, Levant. Herb. Inst. Agron. 69. 1960; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 877 (1960) and 2: 401. 1960; Moldenke, Fifth Summ. 1: 159 & 478 (1971) and 2: 496, 579, & 949. 1971.

The type of this species was collected by Ludwig Riedel (no. 1415) in rocky places near Tejuco (now known as Diamantina), Minas Gerais, Brazil, and is deposited in the Leningrad herbarium. An isotype was photographed by Macbride in the Berlin herbarium as his type photograph number 10580. The original description of the species is worth repeating here: "caule erecto subramoso folioso; foliis caulinis amplexicaulibus adpressis lanceolato-acuminatis mucronulatis canescens; pedunculis fasciculatis lanuginosis; vaginis pubescentibus. Tab. L. Habitat in saxosis prope Tejuco. Flor. Decembri, 4. Obs. Differt a praecedente [P. incanus (Bong.) Körn.]; habitu diverso, pedunculis brevioribus tenuioribus et tenuiter lanuginosis (nec sericeo-incanis); vaginis brevioribus oblique fissis pubescentibus (nec bifidis villosis) capitulis denique florentibus cylindricis (nec sphaericis)."

Ruhland (1903) cites L. Riedel 1415, Schwacke 8476, and Vauthier 5a, all from Minas Gerais, and comments that "Haec species cum praecedente [P. fuscoater Körn.] proxime ad subsectionem Polyactidem spectat. Specimina ramo fertili instructa non vidi." He erroneously cites the binomial, Eriocaulon canescens Bong., to page "625" instead of to page 623 of Bongard's work (1831).

Kunth (1841) states that the plate "50" cited by Bongard was never actually published — probably exists only in the Leningrad

herbarium. Silveira (1928) cites A. Silveira 483 from the Serra dos Crystaes, in the Diamantina region, collected in 1905.

The species is certainly closely related to P. diplobetor Ruhl. and for a comparison of the two species see these notes under that species heading. Irwin, Maxwell, & Wasshausen describe the plant as decumbent, the white flowering-heads erect, and found it growing in wet places in campos in an area of disturbed forest slope and adjacent rocky campo. Other recent collectors describe it as an erect cespitose perennial plant to 1.5 m. tall, the peduncles 35--50 cm. long, the flower-heads white, light-gray, or gray-white, the flowers whitish or white, and found it growing in cerrado in a region of cerrado and low gallery forest, in wet places in cerrado on steep rocky slopes with thin gravelly soil, in moist sand on open rocky slopes, and in wet ground in cerrado in narrow valleys. Miss Mexia refers to it as "common locally in colony in open grassland", while Silva found it to be very frequent in the proximity of sandstone outcrops. It has been encountered at altitudes of 685 to 1350 meters, flowering from December to February, April, and May.

It should be noted here that Körnicke (1863) distinguished his two varieties of this species as follows: var. α "foliis 1—1 1/2-pollicaribus; pedunculis densius quam vaginae pilosis; bracteis involucrantibus obtusis", and var. β "foliis 1/2 — 3/4-pollicaribus; vaginis densius quam pedunculi pilosis; bracteis involucrantibus acutiusculis". He regarded the former as the typical variety, based on Eriocaulon canescens Bong., and typified by L. Riedel 1415. The second variety [unnamed] he typified by Vauthier 59 from "saxosis prope Cidade Diamantina, olim Tejucó, Dec.", Minas Gerais.

Material of P. canescens has been misidentified and distributed in many herbaria under the designations P. incanus (Bong.) Körn., P. incanus Körn., and P. incanus Kunth.

Citations: BRAZIL: Minas Gerais: A. Chase 10365 (Mi, W—1495693); Duarte & Graziela Barroso s.n. [A. P. Duarte 7934; Herb. Brad. 27771] (Ld, N); Irwin, Maxwell, & Wasshausen 20803 (N, N, Rf); Irwin, Reis dos Santos, Souza, & Fonsêca 22363 (Ac, N), 22662 (Ld, Mi, N), 22909 (N, Z); Mexia 5748 (B, Ba, Ca—509762, Go, Mi, N, Qu, S, Ug, Ut—50243a, W—1571901); L. Riedel 1415 [Macbride photos 10580] (B—isotype, Br—isotype, N—isotype, N—photo of isotype, N—photo of isotype, Ut—351—isotype, W—photo of isotype); Schwacke 8476 [Herb. Jard. Bot. Belo Horiz. 26660] (B, B, N), 8477 [Herb. Magalhães Gomes 2967; Herb. Jard. Bot. Belo Horiz. 26664] (N), 8482 [Herb. Jard. Bot. Belo Horiz. 26665] (N); J. B. Silva 593 [Herb. Set. Lag. 730] (Ba); Williams & Assie 6901 (Ca—74438, Er, N, S, W—1932837). MOUNTED ILLUSTRATIONS: drawings & notes by Körnicke (B).

PAEPALANTHUS CANESCENS f. ANGUSTIFOLIUS Ruhl. in Engl., Pflanzen-reich 13 (4-30): 179 [as "angustifolia"]. 1903.

Synonymy: Paepalanthus canescens f. angustifolia Ruhl. in Engl., Pflanzenreich 13 (4-30): 179 & 289. 1903. Paepalanthus canescens var. angustifolia Ruhl. ex Alv. Silv., Fl. Mont. 1: 403. 1928.

Bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 179 & 289. 1903; Alv. Silv., Fl. Mont. 1: 403. 1928; Moldenke, Known Geogr. Distrib. Erioc. 11 & 46. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 82 & 208. 1949; Moldenke, Résumé 96, 323, 324, & 486. 1959; Moldenke, Fifth Summ. 1: 159 (1971) and 2: 579 & 949. 1971.

The type of this form was collected by Álvaro Adolpho da Silveira (Herb. Comm. Geol. & Geogr. Minas 1036) in shaded places in the Serra do Lenheiro, Minas Gerais, Brazil, and is deposited in the herbarium of the Botanisches Museum in Berlin. Ruhland (1903) cites only this collection, but Silveira (1928) cites A. Silveira 781 from the Serra Geral, collected in 1925, as a second collection. Ruhland's description is "Differt a typo foliis angustioribus (medio 1 1/3 mm latis). brevioribus (not ultra 2 cm longis), habitu omnino graciliore."

Citations: BRAZIL: Minas Gerais: A. Silveira s.n. [Herb. Comm. Geol. & Geogr. Minas 1036] (B--type, Z--isotype).

PAEPALANTHUS CAPANEMAE Alv. Silv., Arch. Jard. Bot. Rio Jan. 2: 7-8, pl. 2. 1918.

Bibliography: Alv. Silv., Arch. Jard. Bot. Rio Jan. 2: 7-8, pl. 2. 1918; Correa, Dicc. Pl. Uteis Bras. 1: 654. 1926; Alv. Silv., Fl. Mont. 1: 110--111 & 403, pl. 68. 1928; Prain, Ind. Kew. Suppl. 7: 174. 1929; Stapf, Ind. Lond. 4: 518. 1930; Herzog in Fedde, Repert. Sp. Nov. 29: 206. 1931; Wangerin in Just, Bot. Jahresber. 57 (1): 476. 1937; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 11 & 46. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 82 & 208. 1949; E. Y. Dawson, Los Angeles Co. Mus. Contrib. Sci. 7: 5 & 6, fig. 1 [left]. 1957; Angely, Fl. Paran. 10: 5. 1957; Anon., U. S. Dept. Agr. Bot. Subj. Index 5: 4227. 1958; Moldenke, Résumé 96 & 486. 1959; Moldenke, Phytologia 20: 366. 1970; Moldenke, Fifth Summ. 1: 159 (1971) and 2: 949. 1971.

Illustrations: Alv. Silv., Arch. Jard. Bot. Rio Jan. 2: 8, pl. 2. 1918; Correa, Dicc. Pl. Uteis Bras. 1: 654. 1926; Alv. Silv., Fl. Mont. 1: pl. 68. 1928; E. Y. Dawson, Los Angeles Co. Mus. Contrib. Sci. 7: 5, fig. 1 [left]. 1957.

This species is based on "Ex herb. do Jardim Bot. do Rio de Janeiro sub n. 6.628, in loco non indicato lecta; n. 629 in herb. Silveira". Silveira (1918) notes that the "Species habito Paepalantho minutulo Mart. similis sed lamina vaginæ et bracteis capitulorum valde distincta, cl. Barão de Capanema dedicata". Recent collectors have found this plant in wet sand and adjacent campo with cerrado on outcrops and in the wet sandy margins of sandstone outcrops, at 1000 meters altitude, flowering from February to April and fruiting in February. The flower-heads are described as white and the vernacular name "capuatinga" is recorded. Irwin

and his associates report it "locally abundant in wet places, rocky slopes and wet campo".

Citations: BRAZIL: Goiás: E. Y. Dawson 11616 (Z, Z—photo); Irwin, Grear, Souza, & Reis dos Santos 12614 (Ft); Irwin, Reis dos Santos, Souza, & Fonseca 24647 (Ac, N).

PAEPALANTHUS CAPAROENSIS Ruhl. in Engl., Pflanzenreich 13 (4-30): 145. 1903.

Synonymy: Paepalanthus caparoensis Ruhl. apud Prain, Ind. Kew. Suppl. 3: 126. 1908. Paepalanthus capracoensis Ruhl. ex Moldenke, Known Geogr. Distrib. Erioc. 46, in syn. 1946. Paepalanthus capracoensis Ruhl. ex Moldenke, Alph. List Cit. 3: 730, sphalm. 1949. Paepalanthus caparaoensis Ruhl. ex Moldenke, Résumé Suppl. 1: 20, in syn. 1959.

Bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 127, 145, & 289. 1903; Prain, Ind. Kew. Suppl. 3: 126. 1908; Alv. Silv., Fl. Mont. 1: 126 & 403. 1928; Moldenke, Known Geogr. Distrib. Erioc. 11 & 46. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 82 & 208. 1949; Moldenke, Alph. List Cit. 3: 730. 1949; Moldenke, Phytologia 4: 137. 1952; Moldenke, Résumé 96, 324, & 486. 1959; Moldenke, Résumé Suppl. 1: 20. 1959; Moldenke, Fifth Summ. 1: 159 (1971) and 2: 579 & 949. 1971.

This species is based on two collections from the Serra de Caparaó, Minas Gerais, Brazil: J. T. de Moura 944, collected in June of 1888, and W. Schwacke 6712, collected on February 9, 1890, both deposited in the herbarium of the Botanisches Museum in Berlin, where the former was photographed by Macbride as his type photograph number 10581. Ruhland (1903) comments that the "Species foliis et bracteis involucrantibus insignis. Specimina a cl. Moura collecta multo quam illa Schwackei robustiora sunt". Silveira (1928) cites A. Silveira 596 from the same locality, collected in 1911.

The species has been found growing at altitudes of 1800–3000 meters, flowering in February, March, and June. Mrs. Chase describes it as "scarce" in mossy turf among rocks, while Irwin says that it is "common", forming mounded clumps or tufts 5–10 cm. in diameter among mosses and low grasses in meadows of black muck soil, and describes it as a rosette herb with the flower-heads gray-white.

Additional citations: BRAZIL: Espírito Santo: Irwin 2758 (W—2281314); A. Lutz 1196 (Ja); Mexia 4022 (S, W—1499186, W—1519548). Minas Gerais: M. A. Chase 9715 (W—1282204); Flaster 96 (Bd—8900); Moura 944 [Macbride photos 10581] (B—cotype, N—photo of cotype, N—photo of cotype, W—photo of cotype); Schwacke 6712 (B—cotype); Zikan s.n. [Herb. A. Lutz 2266] (Ja).

PAEPALANTHUS CAPILLACEUS Klotzsch in M. R. Schomb., Reisen [Vers. Fauna & Fl.] Brit.-Guian. 3: 1063, nom. nud. (1848); Körn. in Mart., Fl. Bras. 3 (1): 415–416, pl. 53, fig. 2. 1863.

[to be continued]